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ABSTRACT

A study was conducted by a researcher who observed the mathematics education class and the field experiences of one preservice student teacher. The teacher educator and the target student were the key participants. The focus of the study was on the transition from student to teacher, and on the initial trials of being a teacher. Insights were found on what aspects of teacher education have the most influence on preservice teachers and what effects the teacher educator has on the intentions and actions of the preservice teacher during field experiences. It was observed that the teacher educator's method of teaching future teachers was consistent with his stated goals and beliefs about teaching children. It was also observed that the student teacher, during sessions with children, closely modeled her teaching professor. It was concluded that, in the transition from student to teacher, the student depended upon her professor for guidance and was fully aware of the fact. Discussion between the researcher and the student teacher reveals that participating in this study enabled the student to begin to acquire a reflective or inquiring stance, the capacity for informed and independent judgment, and a commitment to study and learn from experience. (JD)

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LEARNING THE LESSONS OF EXPERIENCE:
A FIELD STUDY IN TEACHER EDUCATION

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and Margret Buchmann

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Abstract

The transition from student to teacher is a complex, multi-dimensional process. Because of this complexity, reflection on experiences and personal responses can be a means of understanding and insight into the role of the teacher as a professional. This paper presents a study in teacher education that focused on the experiences of one preservice teacher as she took a mathematics methods class and then taught students the content she learned. Field research was the methodology used. Through the interaction of researchers and preservice teacher, moments of reflection and personal as well as professional evaluation occurred. The authors suggest that this kind of research provides a basis for the reflective consideration of teaching experiences as they occur during the teacher education program.

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Experience is the best teacher: many people find this statement compelling. But lessons of experience are often neither clearcut nor readily accessible. Learning from experience requires detachment, judgment, and a certain independence. Teacher educators may not be able to count on such habits of mind in their students, and the experiences that are part of teacher education may not encourage them. In university classrooms, teacher educators act as professional role models. Role modeling is a "strong, silent" way of teaching. Its efficacy does not guarantee that what is modeled is appropriate or desirable. Practice teaching can be overwhelming due to classroom complexity and continuous decision making, or deceptively easy, as when a growing capacity for controlling pupils is confused with learning to teach.

Learning to teach depends on thinking; learning from experience depends on the capacity and willingness of future teachers to reflect on their experiences. Reflection requires detachment and an open mind. In a more detached attitude, people stop taking things for granted. Detachment allows for the surprise that accompanies some of the most significant learning. For teachers to be flexible and open-minded may be more important than to be right, since "being right" is a context-dependent and time-bound phenomenon. As Brophy and Good (1974) stress for the case of teacher expectations:

If a teacher accurately perceives a student to be a low achiever, and if he sees this as permanent and unchangeable, he will be relatively unsuccessful in teaching the student. Thus teacher expectations do not have to be inaccurate (as implied in the usual definition of self-fulfilling prophecies) to affect students. Their degree of flexibility, or openness to being changed in response to new data, is even more crucial than their initial accuracy. (p. 85; authors' emphasis)

Detachment is difficult in the initial phases of role assumption. The different experiences in teacher preparation are hard to sort out and to make sense of. The classroom in teacher education is an educational and social system with many facets. There is a group of peers in academic competition. Students take on their professional role in practice teaching, while still receiving grades for their performance. The psychological and emotional aspects of the transition from student to teacher add to this complexity.

Research on teacher education requires a methodology that is sensitive to the different layers of social and educational interaction and to the initial trials of professional role assumption. We think that field research is an appropriate method of inquiry in the social context of teacher education. Involvement in field research, furthermore, contains structured opportunities for reflection. It can help to uncover the lessons of experience in learning to teach.

In their work, field researchers can interact with participants. Some aspects of collecting data, such as interviews or stimulated recall, lend themselves more easily to an interaction about the meaning of events:

Social meanings can be interpreted both in terms of the meanings insiders ascribe to acts and in terms of how the observer views the act. Participants in the setting and the actor may be able to inform an observer of what a particular act signified. . . . Additionally, the outsider can observe the act in terms of how it functions in the setting. (McCutcheon, Note 1, p. 14)

The discussions between researcher and participant provide occasions for personal and professional reflection by both persons. The researcher is challenged to maintain a nonjudgmental and receptive disposition toward the participant, and the participant is challenged to present a clear perception of the issue being examined. Both must consider their involvement in the study as it progresses over time, especially as new hypotheses are generated and discussed.

In general, research on preservice education can inquire into three dimensions of events: knowledge and skills (what is to be or has been taught), pedagogy (the ways and means of teaching), and the social interaction revealed in classroom and field experiences. Field research can look at all three dimensions. Field notes taken during observations provide one source of data for analyzing the knowledge and skills presented to and used by preservice teachers. Observations can also give accounts of the pedagogy employed by teacher educator and future teacher. Social interactions at both research sites can be detailed in field notes, video tapes, and in the preservice teacher's logs. Audio-taped interviews record the events as perceived by participants. Micro-ethnographic analysis of video tapes yields special insights into patterns of individual and social behavior, particularly on the nonverbal dimension. Each data source highlights a different aspect of events. Together they allow for a more comprehensive, intrinsically differentiated understanding of teacher education.

As a case in point, we will present a study of a mathematics class for preservice teachers. The actual study was conducted by Sister Chrisanne Weisbeck, F.S.E. (Note 2). She observed the mathematics class and the field experiences of one target student. The teacher educator and the target student were the key participants.

Learning to Teach: A Field Study

Questions that motivated the study were as follows: What aspects of teacher education have the most influence on preservice teachers? What effects does the teacher educator have on the intentions and actions of the preservice teacher during field experiences? The focus of the study was on the transition from student to teacher, specifically on the initial trials of being a teacher. A question generated during the study was: Is it possible for preservice teacher and researcher to illuminate and further the transition from student to teacher by taking advantage of the occasions for reflection that field research presents?

Events and Sites

In a mathematics course, methods, content, and practice were integrated through field experiences. Fifteen students in the class remained together for a two-term sequence under the same instructor. The course was taught at a large Midwestern university.

The weekly field experiences took place in a local elementary school. A spacious mathematics study room was furnished with tables and chairs. On the basis of their mathematics class, the preservice teachers prepared a lesson to be taught to some pupils. A group of pupils was selected each week by their elementary school teacher to participate in these lessons. The preservice teachers met in the large mathematics room and students were divided among them. Each preservice teacher worked with one, two, or three students. The lessons were conducted simultaneously with as many as six groups in the room. The teacher educator supervised

the activities, writing a comment sheet for each preservice teacher. These sheets were given to the students after their practice lessons.

Data Sources

Data sources for this study consisted of observations, interviews, video tapes, and documents written by the teacher educator and a selected preservice teacher. Over a 10-week period, 19 sessions of the mathematics class (an hour and a half twice a week), and six field experiences (one hour each week) were observed. Field notes were taken during the mathematics class with a focus on the content taught, how it was taught, and the behavior of the preservice teachers as students. On the basis of this documentation and the field notes taken during the observation of field experiences, it was possible to compare the teaching of the teacher educator with that of the preservice teacher.

Both the teacher educator and the selected student were formally interviewed. Through the interviews data were gathered from both participants about their expectations of themselves as teachers and their beliefs about teaching. The preservice teacher shared a personal interpretation of the transition from student to teacher with the researcher. Three video tapes were taken and used as instruments of stimulated recall during some of the interviews. One session of the mathematics class at the university was taped and viewed by researcher and teacher educator. Two of the practice lessons taught by the selected preservice teacher were taped and viewed by researcher and student participant.

Documents included written comments and suggestions by the teacher educator given to the preservice teacher after each field experience. The preservice teacher responded to this set of statements with written comments. Five sets of such written documents were collected. In addition to these papers, each preservice teacher kept a log or journal of each field experience, recording the event as well as personal reflections about the pupils or lesson. Five journal entries were collected from the target student.

Key Participants

The participant teacher educator, Greg Forster¹, held a master's degree in mathematics and a Ph.D. in mathematics education. This was his fourth year of teaching the integrated mathematics course. He volunteered to be a participant in this study.

The participant student, Jane Tern, was selected by the field researcher after observations during the classroom sessions and the first field experience. The criteria used for selection were attitude in class, sense of responsibility, and willingness to learn. The researcher relied on intuition in selecting a student participant to whom she could easily relate and who might feel at ease with her. The focus of the study on the transition of a preservice teacher from student to teacher was explained. Jane readily accepted the offer to be key student informant, and agreed to being video taped and tape recorded.

¹The names used here are not the real names of the key participants.

Teacher Educator and Student as Teacher

Informally the participant teacher educator, Greg, commented that the best preparation for being a teacher consists in having as many different kinds of experiences with different kinds of children as possible. This belief was focal to the class he taught. He aimed at giving preservice teachers many and diverse experiences with pupils. He taught the class content so it could be used in student teaching, and he consistently emphasized "learning from the kids"--listening to them and drawing out what they know.

As desirable teacher qualities and capacities, Greg listed: likes children; can get to know children; can "read" what a child is saying; is good at a particular thing; has a sense of humor, common sense, and insight; and is intelligent. He made a statement about himself as a teacher, "I can't play act. I've got to be allowed to be myself." This belief could be inferred from his casual dress and relaxed attitude with students. During class sessions he often told stories about himself or presented his own views on a particular issue. Instances of this are recorded in the field notes on the following days: 11/21/77, 10/6/77, 10/25/77.

During the first class period (9/29/77), Greg presented his approach to this mathematics class. As he outlined the course he wrote on the blackboard:

What do kids think about things?
What can they do?
What can't they do?

By looking closely at Greg's teaching--keeping in mind his statements and goals about children--it could be documented that Greg used the

same principles in teaching preservice teachers. What he modeled in his teaching of future teachers was consistent with his stated goals and beliefs about teaching children.

As a student in the mathematics class, as recorded on the field notes for 10/13/77, 10/20/77, 11/1/77, Jane appeared to be a serious and responsible student who paid attention during class. This inference was made after several observations in the mathematics class. Greg often called on Jane during problem-sharing sessions in class. She always had a response ready, but seldom volunteered an answer. She took notes during class and turned in assignments on time.

Outside of class Jane asked Greg for suggestions about teaching the practice lessons. She came prepared for each field experience with notes for herself and the equipment needed for the pupils. She was punctual and missed only one of the field experiences, due to a flat tire on the way to school.

As a teacher, Jane mainly asked questions. She had a teaching pattern that consisted of an introduction or explanation, followed by examples and work problems for the pupils. If there were difficulties in understanding the material, Jane would stop and explain once more.

Greg stated that he wanted the preservice teachers to pay attention to their pupils' thinking, and to notice what they could and couldn't do. For evidence that Jane followed Greg's directives, field notes on her practice lessons, her own logs, and the comment sheets by the teacher educator were examined. Some of Jane's own statements

recorded respectively in field experiences 10/14/77, comment sheet 10/21/77, field experiences 10/28/77, log 11/11/77, and log 12/9/77 are particularly enlightening in this regard.

I enjoyed watching her while she was thinking--smiling as I watched her. I thought it was fun. I was nervous at first but not after I got started.

I think she told me quite a bit for being only a third grader.

I don't feel like I accomplished anything. He didn't know what a rectangle was when we were finished.

This was a very good reasoning for a third grader to come up with.

After that the lesson didn't go as I had planned. One reason for this may have been that the two children didn't work together well.

The capacities of pupils and their thinking were definitely considered by Jane as she reflected on the practice lessons and her own teaching.

As the observations of the field experiences progressed, the researcher began to compare the mathematics class for preservice teachers with the corresponding practice lesson. This comparison brought out a strong tendency on Jane's part to behave as a teacher in accordance with the preparation given by her teacher educator. For a detailed illustration of this phenomenon two examples are discussed below.

The Influence of the Teacher Educator: Two Examples

Greg demonstrated in the mathematics class how one can cut out representations of numbers by using graph paper. One block stands for one, two blocks for two, and so on. To cut out the addition problem $1+2+3$, students were asked to cut out representations of these numbers

in a way that demonstrates the addition problem. One can do this by cutting a straight row with six blocks, or one can cut out each number and stack them so that they form stairs. By making two sets of stairs that each show $1+2+3$, and arranging the stairs so that one set has one on the top and three on the bottom, while the other has three on the top and one on the bottom, two sets can be put together to form a rectangle four units long and three units wide, thus comprising 12 units. Through division of the 12 by two, the answer to the addition problem can be arrived at: $1+2+3 = 6$. By using the stair pattern and increasing the number of integers being added, one can develop a pattern that helps to find answers to addition problems involving consecutive integers. The preservice teachers did this exercise in their mathematics class, and Jane used it in a practice lesson for the pupil Cindy in the following manner.

Jane started out by asking Cindy to cut out the problem $1+2+3$. Cindy did not, however, cut out the stairs first. Jane then asked her if she could make the problem look like stairs. Eventually Cindy was able to accomplish this. Together they made the rectangle. Jane then asked Cindy how to do the problem 3×4 , which involved measuring the sides of the rectangle. Jane and Cindy made another rectangle for the next problem, $1+2+3+4$, and continued the lesson.

As the problems got larger, Jane asked Cindy what the total number of units in one of the rectangles would be. Cindy didn't know and did not know how to find out. Greg had said if a pupil doesn't know how to find the number of units in a rectangle, it is not possible

to continue the lesson. Jane decided to do something else with Cindy. She appeared to abide by Greg's directions.

For further documentation, statements Greg made in class (10/20/77) in the presentation of the content are listed below, followed by a sequence of statements by Jane, made during the corresponding practice lesson (10/21/77):

1. Lesson Preparation--Greg

Develop formula:

"Can you show this $[1+2+3]$ in some way with scissors?"

"Can you make a rectangle?"

"The kid should know how to find the number of units in a rectangle."

"If the kid doesn't know, can't go on from here."

"Up to you to organize the data for the kid so he sees the problem."

"Do this and see what happens."

Practice Lesson--Jane

"I want you to cut out $1+2+3$ any way you can."

"Now can you think of a way that looks like stairs?"

"Can you see where you might get 3×4 ?"

"What would be your total units?" You don't know? O.K."

"Now I have something for you here."

In the second example the topic is measuring with metric units.

In the mathematics class the preservice teachers spent most of their time measuring things. They used various units in measuring, experimented with estimation, then measured to check their estimations. Greg encouraged them to start their practice lessons by measuring "appropriate" things. He urged them to get the pupils involved, to estimate, and to check the answers by measurement.

Jane began her lesson by having her two pupils measure their hand spans. She got them involved by using their hand span as a unit for measuring other things. They estimated and checked measurements. Jane had them estimate their "wing span" in relationship to their height.

She used nonstandard units of measure, such as the hand span, as well as standard units of measure, such as the centimeter. The rules laid down by Greg for his students were applied directly by Jane in her teaching. Fieldnotes taken during the mathematics class (11/10/77) and during the field experiences (11/11/77) of the target student document this:

2. Lesson Preparation--Greg

"All you do is start out by measuring things."

"Measure appropriate things."

"Get kids involved in the experience of measuring."

"Three things are important: Estimate, measure, check estimate."

Practice Lesson--Jane

"We're going to start with measuring your hand span."

"Measure the table using your hand span."

"Have you guys ever heard of your wing span?"

"Do you think your wing span would be about the same as how tall you are?"

After the field experience from which the second example was drawn, Jane was asked if she had accomplished her goal. She replied, "I don't really have a goal. I just wanted to see if they know what centimeters are." Jane also said, "Greg said only have them measure appropriate things. So I didn't know what to have them measure." When Greg gave Jane suggestions or comments after a lesson, (such as on 11/11/79), her response often was, "I didn't think of that." In the light of these comments and self-perceptions, Jane's dependence on Greg as a teacher educator becomes understandable. We quote Jane, as she makes this point herself in an interview on 12/19/77:

I especially like the way he prepared us to teach. He told us exactly what to say, what to do, and what to expect. I can't do it if someone doesn't help me like that.

In the following excerpt from an interview (11/21/77) there is evidence of another interesting phenomenon. It seems that Jane came to perceive her own needs as she was learning to become a teacher in accordance with Greg's beliefs:

Interviewer: What do you think is Greg's main objective for the class?

Jane: I think he wants us to get a lot of experience with kids themselves, in seeing how they develop and what stages they are at, what they can do at different levels, or just being able to go in with a lesson and come out saying they can accomplish this or that.

Interviewer: What do you feel is the most important thing for you in terms of teacher preparation?

Jane: I think a lot more working with kids in the classroom is what I really need because I think that's one of the best ways to find out how to do things.

To be influenced by a professional model, however, does not mean that subtle and complex moves toward independence and thoughtfulness cannot occur. We found such moves exemplified in Jane's struggle for an objective and detailed understanding of her final field experience. Reflection on this practice lesson made her more open-minded and helped her learn.

Learning from Teaching

As part of the documentation of Jane's working with children, a video tape of her final field experience was made. At the end of this lesson Jane was upset. She felt her lesson had been a failure and that, therefore, she was a failure as a teacher. The researcher tried to find what it was about the lesson that made Jane feel like a failure. But

at this point, the emotional intensity of the experience did not allow Jane to be detached or analytical.

Some time later, Jane and the researcher met to discuss the findings of the study and to look at the video tape of the final field experience with a focus on social interaction. During this lesson, discussion focused on the postural patterns and resulting responses of Jane and the pupils, and on the particular ways in which Jane realized Greg's goals in her teaching.

This discussion was a time of insight for both researcher and participant. What had once seemed like chaos and confusion became organized into meaningful patterns. Jane was able to see strengths and weaknesses in the teaching of her final lesson. She detached herself from feelings of failure and concentrated on phenomena in this experience from which she could learn. The researcher and she recognized and discussed levels of verbal and nonverbal interaction. She learned to interpret children's posture around the table as a sign of their involvement or lack of involvement in the lesson. She began to see her own posture and movements as significant elements of the teaching-learning situation. Disciplined inquiry into what happened overcame the limitations of her feelings about experience. In learning to teach, reflection thus became a practical activity, if not in Brann's (1979) words, "the first practical activity." (p. 5)

There was a last meeting with Jane (2/8/78) in which the research findings and the focus of the final report were discussed. During this meeting she stated the following about the influence of her teacher educator:

I think I am already using it, kind of, not in math but like in my reading where I'm tutoring this term. In a way maybe, just because, I don't know, it just seems like I'm kind of going the way he says.

Greg's influence on Jane was apparently not confined to the content area of his class; Jane applied his teaching to other subjects.

From all that we learned in this study we concluded that, in the transition from student to teacher, Jane depended on Greg for guidance. However, she was also open to seeing herself as an agent in this struggle. She learned to stretch beyond her personal feelings to engage in the professional reflection that accompanied research involvement. The analysis and discussion of the video tape documented and furthered a shift from a personal concern with performance to a more detached and reflective attitude. Hence this study helped a pre-service teacher to acquire what Feiman (1979) calls "professional discipline: a reflective or inquiring stance; the capacity for informed and independent judgment; the commitment to study and learn from one's own experience" (p. 77).

Teachers, like any professionals, have to begin somewhere. We think that it may be less important to know what the initial practices of young teachers are than to see whether these and other experiences are taken advantage of as occasions for reflection.

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